

REMARKS

Claims 42 and 46-48 are canceled. New claims 56-64 are added. The new claims are supported by the originally-filed application at, for example, pages 8-9 and 12.

In response to an objection to claim 52, the claim is amended as suggested by the Examiner, and therefore, this objection is rendered moot.

Claim 36 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,686,298 B1. A terminal disclaimer is filed herewith and renders the obviousness-type double patenting rejection moot.

Claims 36-45, 49-55 are rejected under 35 U.S.C. §102(e) as being anticipated by Hattangady et al. (U.S. Patent No. 6,399,445 B1). Claims 36-43, 45, 49-52, 54-55 are rejected under 35 U.S.C. §102(e) as being anticipated by Grinder, III et al. (U.S. Patent No. 5,969,397).

Independent claim 36 stands rejected as being anticipated by Hattangady and Grinder, respectively. Claim 36 is amended to recite exposing the silicon-dioxide-containing layer to an activated nitrogen species *formed from **plasma** conditions* to provide nitrogen within the silicon-dioxide-containing layer. The amendment language is supported by the originally-filed application at, for example, page 8. Grinder teaches forming a layer 114 with nitrogen by one of the following methods: low pressure chemical vapor deposition (LPCVD); a conventional furnace; or a single wafer reactor (col. 3, Ins. 15-22). However, Grinder has no teaching to an activated nitrogen species formed from **plasma** conditions as recited by claim 36. Regarding Hattangady, such reference teaches forming a layer 5 of silicon nitride by the following method: first forming a silicon dioxide layer 3; passing charged nitrogen atoms from a plasma through a negatively charged screen to neutralize the charged nitrogen atoms (col. 3, Ins. 23-59); and then the "neutral

atoms of nitrogen are then impinged upon the exposed surface of the silicon oxide to form ... layer 5" (col. 3, Ins. 25-29). That is, Hattangady teaches **neutral** atoms of nitrogen are used to form nitride layer 5, but does not teach *exposing the silicon-dioxide-containing layer* to an **activated nitrogen species** as recited by claim 36. Consequently, Grinder and Hattangady, singularly or in any combination, fail to teach or suggest exposing the silicon-dioxide-containing layer to an **activated nitrogen species** *formed from plasma conditions* to provide nitrogen within the silicon-dioxide-containing layer as positively recited by claim 36. Claim 36 is allowable.

Claims 37-41 and 56-58 depend from independent claim 36, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not taught or shown by the art of record.

Claim 43 stands rejected as being anticipated by Hattangady and Grinder, respectively. Claim 43 is amended to recite exposing the silicon-dioxide-containing layer to **nitrogen ions** to provide nitrogen within only the upper portion of the silicon-dioxide-containing layer. The amendment language is supported by the originally-filed application at, for example, pages 7-8. Grinder teaches forming a layer 114 with nitrogen by one of the following methods: low pressure chemical vapor deposition (LPCVD); a conventional furnace; or a single wafer reactor (col. 3, Ins. 15-22). However, Grinder has no teaching to **nitrogen ions** as recited by claim 43. Regarding Hattangady, such reference teaches forming a layer 5 of silicon nitride by the following method: first forming a silicon dioxide layer 3; passing charged nitrogen atoms from a plasma through a negatively charged screen to neutralize the charged nitrogen atoms (col. 3, Ins. 23-59); and then the "neutral atoms of nitrogen are then impinged upon the exposed surface of the silicon oxide to form ... layer 5" (col. 3, Ins. 25-29). That is, Hattangady teaches neutral atoms of nitrogen are used to form nitride layer 5, and not **nitrogen ions** as recited by claim 43. Consequently,

Grinder and Hattangady, singularly or in any combination, fail to teach or suggest exposing the silicon-dioxide-containing layer **to nitrogen ions** to provide nitrogen within only the upper portion of the silicon-dioxide-containing layer as positively recited by claim 43. Claim 43 is allowable.

Claims 44-45 and 59-61 depend from independent claim 43, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not taught or shown by the art of record.

Claim 49 stands rejected as being anticipated by Hattangady and Grinder, respectively. Claim 49 is amended to recite exposing the silicon-dioxide-containing layer to nitrogen atoms, and during the exposing, the **nitrogen atoms comprising a higher energy state than their ground state** to provide nitrogen primarily within the upper surface of the silicon-dioxide-containing layer. The amendment language is supported by the originally-filed application at, for example, pages 7-8. Grinder teaches forming a layer 114 with nitrogen by one of the following methods: low pressure chemical vapor deposition (LPCVD); a conventional furnace; or a single wafer reactor (col. 3, Ins. 15-22). However, Grinder has no teaching to nitrogen atoms comprising a higher energy state than their ground state as recited by claim 49. Regarding Hattangady, such reference teaches forming a layer 5 of silicon nitride by the following method: first forming a silicon dioxide layer 3; passing charged nitrogen atoms from a plasma through a negatively charged screen to neutralize the charged nitrogen atoms (col. 3, Ins. 23-59); and then the "neutral atoms of nitrogen are then impinged upon the exposed surface of the silicon oxide to form ... layer 5" (col. 3, Ins. 25-29). That is, Hattangady teaches using neutral atoms of nitrogen to form nitride layer 5, and but not by using *nitrogen atoms comprising a higher energy state* than their ground state as recited by claim 49. Consequently, Grinder and Hattangady, singularly or in any combination, fail to teach or suggest exposing the silicon-

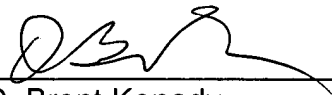
dioxide-containing layer to nitrogen atoms, and during the exposing, the nitrogen atoms comprising a higher energy state than their ground state as positively recited by claim 49. Claim 49 is allowable.

Claims 50-55 and 62-64 depend from independent claim 49, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not taught or shown by the art of record.

This application is now believed to be in immediate condition for allowance, and action to that end is respectfully requested. If the Examiner's next anticipated action is to be anything other than a Notice of Allowance, the undersigned respectfully requests a telephone interview prior to issuance of any such subsequent action.

Respectfully submitted,

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